

REMARKS

This is in response to the Official Action currently outstanding in the above-identified application.

Claims 3-5, 7, and 18-20 were presented for consideration in the last Amendment filed in the above-identified application. Claims 3-5, 7 and 18-20 stand rejected in the currently outstanding Official Action. By the foregoing Amendment, Claims 5 and 18 have been amended for clarity. No claims have been added, and no claims have been canceled. A "**VERSION SHOWING THE CHANGES MADE TO THE CLAIMS**" is attached as required by the Rules. Accordingly, upon the entry of the foregoing Amendment, Claims 3-5, 7 and 18-20 as hereinabove amended will constitute the claims under active prosecution in this application.

In the currently outstanding Official Action, the Examiner has:

1. Again acknowledged Applicants' claim of foreign priority under 35 USC 119(a)-(d), and confirmed the safe receipt of the priority document for this application by the United States Patent and Trademark Office.
2. Provided Applicants with a copy of a Notice of References Cited (PTO-892), copies of the newly cited references.
3. Rejected Claims 3-5, 7 and 18 under 35 USC 103(a) as being unpatentable over the Kim, et al. reference (U.S. Patent No. 5,933,208) in view of the Shirahashi et al reference (U.S. Patent 5,285,301), the Sato et al reference (U.S. Patent 6,081,305), and the Miyawaki et al reference (U.S. Patent 5,822,028).

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4. Rejected Claims 3-5, 7 and 18 under 35 USC 103(a) as being unpatentable over the Noda, et al. reference (U.S. Patent No. 5,585,951) in view of the Shirahashi et al reference (U.S. Patent 5,285,301), the Sato et al reference (U.S. Patent 6,081,305), and the Miyawaki et al reference (U.S. Patent 5,822,028).

5. Rejected Claims 3-5, 7 and 18 under 35 USC 103(a) as being unpatentable over the Kawabe, et al. reference (U.S. Patent No. 6,162,654) in view of the Shirahashi et al reference (U.S. Patent 5,285,301), the Sato et al reference (U.S. Patent 6,081,305), and the Miyawaki et al reference (U.S. Patent 5,822,028).

6. Provided Applicants with his response to their previously filed Amendment.

With regard to items 1 and 2, further detailed discussion in these Remarks is not believed to be necessary.

With regard to items 3 - 5, Applicants respectfully call the Examiner's attention to the fact that Claims 5 and 18 have been amended for the purpose of improving the clarity of their expression. The amendment to Claim 5 also corrects an inadvertent mistake in Claim 5 as it presently stands; namely, it is the light shielding layers that adjacently surround the color filters, not the light shielding frame layer. Applicants respectfully submit that the obviousness of this inadvertent error is so clear in light of the specification that further comment in justification for the foregoing Amendment is unnecessary in these Remarks. Entry of the foregoing Amendment in response to this communication, therefore, is respectfully requested.

Applicants again respectfully **traverse** the Examiner's substantive rejections of the claims presently pending in this application under 35 USC 103(a). The bases of this traversal and Applicants' rebuttal of the Examiners Response to Amendment portion of the currently outstanding Official Action are set forth below.

In the currently outstanding Official Action, the Examiner indicates with respect to the Kim, et al, the Noda, et al, and the Kawabe et al primary references that each discloses every element of the present claims *with the exception that it is not clear from any of the references that the black matrix contained in the respective display regions disclosed also goes around the perimeter of its associated display region.* Also, in an attempt to supply this missing element, the Examiner asserts that the use of a black matrix portion extending around the perimeter of a display region in a device of the type herein claimed and shown in the primary references was notoriously well known for preventing light leaking and for shielding for the drive circuits. The Examiner then concludes that the present claims would have been obvious. Also, in further support of his position, the Examiner argues that all of the secondary references (Shirahashi et al, Sato et al, and Miyawaki et al) show active matrix devices with black layers in the extending peripheral regions thereby providing evidence in support of his assertion of the well known status of these layers for the above mentioned purposes.

Further, in his response to Applicants' previous Amendment, the Examiner alleges that Applicants have not challenged his assertion that it was well known to extend the black matrix into the pixel portions of a display device, but instead simply have argued that none of the primary references is anticipatory of the present invention. In addition, the Examiner suggests that the Applicants have somehow failed to consider the references cited in combination.

Still further, the Examiner again asserts that:

"...it was notoriously well known that the peripheral portion had to be light shielded and was normally done with already present black matrix, and that the collective references clearly provide evidence of this fact, points to which applicant has not challenged. If it is well known to make the black matrix extend to surround the pixel area, it is not material that the examples have the black matrixes supplied as the examples show the counter electrode substrate. Further, since a light-absorbing layer is on the first substrate, that light-absorbing layer would be used as the light absorbing layer elsewhere, as to use a different one without reason would be the addition of an unnecessary layer, which those skilled in the liquid crystal art, where the level of skill is high, would have been obvious not to do." (Emphasis added)

Applicants respectfully disagree.

Specifically, Applicants respectfully submit that the Examiner has oversimplified the present invention as set forth in the claims in the currently outstanding Official Action. Thus, it will be understood that claims specify not only "a light shielding frame layer disposed around the periphery of said display region" as recognized by the Examiner, *but also that the light shielding frame layer is located on the first insulative substrate.*

Hence, contrary to the Examiner's statements in the currently outstanding Official Action, Applicants have challenged (and continue to challenge) the Examiner's apparent positions that it is normal in the art to extend the black matrix surrounding the picture elements outwardly of the periphery of the display region without regard to whether the peripheral extension is located on the first or the second insulative substrate. As previously noted, the Examiner has admitted that none of the cited primary references shows the extension of the black matrix surrounding the picture elements outwardly of the periphery of the display region. Further, Applicants have steadfastly argued in this prosecution that not only is the cited art not anticipatory of the present invention, *but also that the combination of references suggested by the Examiner is insufficient to meet the Examiner's prima facie burden in the establishment of the obviousness of the presently claimed invention.*

The standards for the establishment of a so-called "*prima facie*" case of the obviousness of a claimed invention under 35 USC 103 are well settled. For example, it is stated in MPEP Section 2142 that:

"...(t)o establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all of the claim limitations. **The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991)**" Emphasis added

It is respectfully again submitted that the Examiner's currently outstanding rejections fail to meet these standards.

It has already been noted that the Examiner has admitted that none of the primary references cited contain a clear teaching, disclosure or suggestion to the effect that the black matrix surrounding the picture elements on a first insulative substrate goes around (i.e., extends outwardly from) the periphery of the display region containing those picture elements and that matrix.

Applicants also have already pointed out during the course of this prosecution that the Shirahashi et al reference discloses the use of a black region BM around the perimeter of an active matrix device, but the black region BM in the Shirahashi et al reference surrounding the display region is disposed on the counter substrate SUB2 (see, Shirahashi et al, Column 3, lines 36-45 and Fig. 3). Therefore, as evidence of the presence of a light shielding layer in an active matrix device, the Shirahashi et al reference essentially teaches nothing more than the prior art disclosed in the DESCRIPTION OF RELATED ART section, and in Figs 6 and 7, of the present application, i.e., a light shielding frame layer located on the counter electrode carrying substrate.

The situation with respect to the Miyawaki et al reference is similar. In particular, it is indicated at column 4, lines 4-5, of the Miyawaki et al reference that the black matrix 59 located at the periphery of the device is provided on the counter substrate 62 (see also Fig. 1a of the Miyawaki et al reference).

Applicants, therefore, have submitted, and continue to submit, that a combination of any of the currently applied primary references either with the Shirahashi et al reference, or with the Miyawaki et al reference, lacks an essential feature of the present invention, i.e., that the light shielding frame layer is disposed on the first insulative substrate. Thus, all of the claim limitations of this application are not disclosed, taught or suggested by any combinations of the primary references with either the Shirahashi et al reference, or with the Miyawaki et al reference as suggested by the Examiner. Accordingly, none of those combinations are sufficient to support a rejection based upon obviousness under 35 USC 103(a) under the standards quoted above. A decision withdrawing these grounds of rejection of the presently pending claims in response to this communication, therefore, is respectfully requested.

In addition, the above requested withdrawal of the Examiner's rejection based upon combinations of any of the primary references with the Shirahashi et al and/or the Miyawaki et al references is appropriate in this case because none of those combinations would result in (or suggest) the solution of the problem addressed (and solved) by the present invention as will be discussed in more detail below.

Similar arguments apply to the Examiner's proposed combination of the primary references with the Sato et al reference. Specifically, the Sato et al reference broadly may be said to disclose a black (i.e., shaded) peripherally located portion (see Sato et al at Fig. 5, reference numeral 166) on a semiconductor substrate. Further, as might be expected from the fact that the semiconductor substrate directly participates in the switching present in the Sato et al reference the problems addressed by the primary references on the one hand and the Sato et al reference on the other hand are so different from one another that the combination thereof by a person of ordinary skill in the art so as to render the present invention unpatentable under 35 USC 103(a) as suggested by the Examiner would **not** have been likely at the time the present invention was made.

As mentioned previously, the purpose of the present invention unambiguously is to provide a reduction of the complexity present in the prior art of adhering a TFT substrate to a counter substrate in the manufacture of a liquid crystal display device. The primary references are not concerned with the peripheral area surrounding the display region, but rather are concerned with improvements in the aspect ratio of the display region by controlling the width of the black matrix portions between picture elements. The Sato et al reference, on the other hand, is directed to the provision of enhanced light-fastness to the switching and drive circuit areas of a projection type active matrix device intended for use under conditions wherein the device is subject to irradiation by light in the millions of lux range (see Sato et al, Column 4, lines 41 to 53). This is accomplished in the Sato et al setting by a series of stacked, electrically interconnected layers defining selected shading areas. It is respectfully submitted that the purposes of the cited primary references and of the Sato et al reference are so different from one another that it clearly is unlikely that a person of ordinary skill in the art at the time the invention of this application was made would have been lead to combine them for any purpose, much less for the purpose addressed by the present invention.

Therefore, Applicant again respectfully submits that the combination of references suggested by the Examiner in the currently outstanding Official Action can only be justified utilizing the disclosures contained in the present specification. As mentioned above, this constitutes hindsight or so-called "obvious-to-try" reasoning that is not proper in determining the patentability of claims under 35 USC 103(a).

In view of the foregoing, it is clear that the Examiner has lost sight of the essential features of the present invention in the course of his rejections. In particular, it is to be noted that the present invention is an easy-to-manufacture color liquid crystal display device wherein:

1. all of the TFT's, the plurality of color filters and the light shielding frame layer are formed on the same insulative substrate, thereby facilitating the manufacture of the device;
2. the light shielding frame layer is disposed close to the most-outside ones of the picture element electrodes around a periphery of the display region formed by those picture electrodes and their associated black matrix, and the light shielding layers are formed by the same material as that forming the light shielding frame layer for shielding light inputted on the upper portion of an active element conductively connected to the picture element electrodes (note, this provides a light shielding frame layer that does not generate light discharge without adding any new steps to the manufacturing of the device); and
3. the light shielding layers and the light shielding frame layer are formed of the same materials at the same time thereby avoiding the necessity of a separate layer formation, and the opposing substrates are formed with opposed electrodes and aligning films that correspond to the display region, but not the light shielding frame layer, thereby avoiding any necessity for special techniques for the attachment of the substrates one to the other with fine precision.

Hindsight is 20/20. Therefore, it is easy to reason that since the primary references show a light shielding layer (black matrix) filling the gaps between the picture electrodes on a first substrate that those skilled in the art would use an extension, or at least a separate portion of, that layer for light shielding functions at other desired locations on the first substrate. It also is easy to intuitively reason that persons skilled in the art would attempt to avoid the creation of separate light shielding layers if possible.

The latter line of reasoning, however, totally begs the question. Thus, even if it is assumed that a light shielding frame is desired, the art of record teaches, discloses and/or suggests only that in a context similar to that claimed a light shielding frame layer should be disposed on the second substrate rather than the first substrate. Applicants have pointed out, and presumably the art has recognized, that this requires either very precise alignment of the substrates during assembly or the provision of substantial tolerances in the dimensions of the light shielding frame layer relative to the peripheral size of the display region. Nevertheless, however, despite this standing difficulty in the art, there is no teaching, disclosure or suggestion of the solution provided by the present invention in the art cited.

In summary, therefore, the present application presents a classic case of the application of hindsight reasoning and/or so-called "obvious-to-try" logic in the examination of the claims of an application before the United States Patent and Trademark Office. In particular, the Examiner has located art showing the use of a black matrix around the peripheries of the picture elements on a first substrate as contemplated by the present invention. To this the Examiner engrafts the general concept that a black frame surrounding the display region in such a setting is generally known in the art citing art to show "active matrix devices with black layers in the extending peripheral regions" *while at the same time admitting that the primary art that he has located does not show either this or the location of that frame on the same substrate as the black matrix surrounding the picture elements.* Then, not having any art showing the placement of the black peripheral frame region on the same substrate as the black matrix around the picture elements in a context analogous to that claimed, the Examiner makes the logical leap to the assertion that: "Further, since that light absorbing layer is on the first substrate (i.e., surrounding the picture elements), that light absorbing layer would be used as the light absorbing layer elsewhere, as to use a different one without reason would be the unnecessary addition of an additional layer, which those in the liquid crystal art, where the level of skill is high, would have been obvious not to do."

The problem with this is that the Examiner has provided no support for the latter assertion, and indeed, two of the secondary references that he cites show the peripheral frame located on the substrate opposite to that carrying the picture elements and the black matrix associated therewith. Hence, the very evidence that the Examiner has attempted to utilize to support his position in fact shows the reverse, i.e., that a person of ordinary skill in the liquid crystal art during the 1990's would, and in fact did, place the peripheral frame on the substrate opposite to that herein claimed. Therefore, all of the presently claimed limitations are not disclosed in the cited art in the context in which they appear in this invention, and there is no clear suggestion that those elements even if abstractly shown in that art should be combined in the manner herein claimed. The suggestion for doing so comes from the Applicants' specification, not the cited prior art.

Stated slightly differently, the Examiner's intuitive feeling apparently is that since a peripheral frame area surrounding a display region is in his estimation well known in the art, the one of the substrates and/or the type of substrate upon which that peripheral frame area is disposed are essentially irrelevant details that may be disregarded in his examination of the present claims. Thus, the Examiner has located art showing a black matrix surrounding picture elements on an insulative substrate, but that art fails to disclose the peripheral area claimed. Accordingly, the Examiner proceeds to state as a general proposition that peripheral areas surrounding display areas containing picture elements within a black matrix are well known in the art. Then, from the primary art cited and the general proposition stated, the Examiner concludes that the present invention is obvious without specific regard to its detailed provisions concerning the nature of the substrate and/or the one of the substrates upon which both the black matrix and the black peripheral area are disposed. Finally, as an aside, the Examiner cites art in support of his general proposition, but again fails to apply that art directly to the specific limitations of the presently claimed invention.

Thereafter, once the Applicants demonstrated that the secondary art cited in support of the general proposition is insufficient to teach, disclose or suggest in combination with the primary references all of the elements of the claimed invention, the Examiner accuses that Applicants of failing to deal with the combination of references that he has suggested. As noted, this begs the question. The point is that the secondary art cited does not show the limitations of the present claims that the Examiner has admitted are not disclosed, taught or suggested by the primary references. In this situation, the Examiner's rejections are respectfully submitted to be inadequate to satisfy the burden of proof necessary to reject the present claims as being unpatentable under 35 USC 103(a).

For each, and all, of the foregoing reasons, Applicants believe that the Examiner's currently outstanding rejections are in error as constituting the application of improper hindsight reasoning and/or an improper "obvious-to-try" standard of patentability. Therefore, Claims 3-5, 7, 18, 19 and 20 of this application, as they will stand upon the entry of the foregoing Amendment, are in condition for allowance. Reconsideration, entry of the foregoing Amendment, and allowance of this application in response to this communication are respectfully requested.

Applicants also believe that additional fees beyond those submitted herewith are not required in connection with the consideration of this response to the currently outstanding Official Action. However, if for any reason a fee is required, a fee paid is inadequate or credit is owed for any excess fee paid, you are hereby authorized and requested to charge and/or credit Deposit Account No. **04-1105**, as necessary, for the correct payment of all fees which may be due in connection with the filing and consideration of this communication.

Respectfully submitted,

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VERSION SHOWING CHANGES MADE TO THE CLAIMS

Additions shown underlined; Deletions shown in brackets.

IN THE CLAIMS:

Please amend Claims 5 and 18 as follows:

5. (Twice Amended) A liquid crystal display device according to claim 18, wherein [the light shielding frame layer is formed of three different filters] said plurality of color filters includes color filters of three different kinds, one of said [filters] kinds being red, one of said [filters] kinds being green and one of said [filters] kinds being blue; and wherein said color filters are surrounded by said light shielding layers.

18. (Four Times Amended) An easy-to-manufacture color liquid crystal display device, said device comprising:
a first insulative substrate on which picture element electrodes are aligned in a matrix configuration defining an image display region; and a second insulative substrate on which a counter electrode is disposed;

wherein said first insulative substrate and said second insulative substrate are adhered to each other with a liquid crystal material interposed therebetween such that each said picture element electrode faces at least a portion of said counter electrode; and wherein said first insulative substrate further includes thereon a plurality of switching elements connected respectively to said picture elements, line means for supplying signals to said switching elements, a plurality of color filters arranged to correspond respectively to selected ones of said picture element electrodes [in] defining said display region, a light shielding frame layer [disposed close to the most-outside] defining an inner edge and being disposed such that said inner edge is located substantially adjacent to the outermost ones of the picture element electrodes [around a periphery of] in closely surrounding relationship with said display region, and light shielding layers corresponding to said switching elements for shielding incident light thereon.